

Oversubscribed Mission Scheduler Conflict Resolution System, Phase I

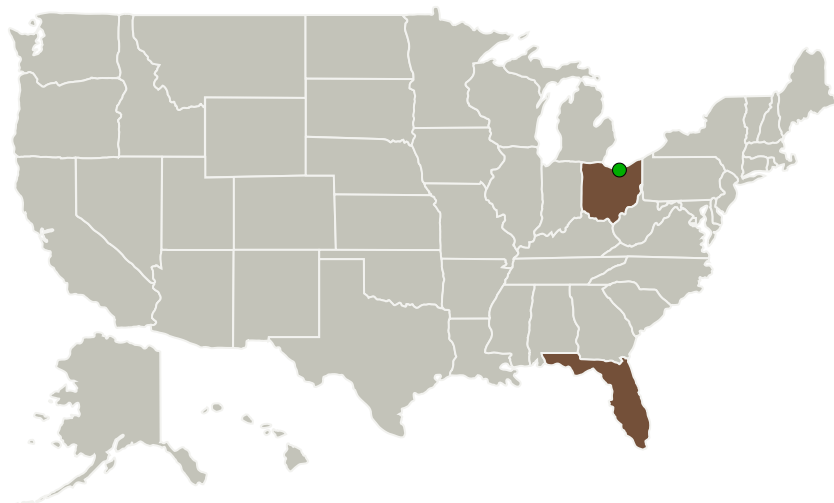
Completed Technology Project (2010 - 2010)



Project Introduction

The allocation and scheduling of limited communication assets to an increasing number of satellites and other spacecraft remains a complex and challenging problem. Feasible schedules that address mission requirements over the short, medium and long term are inherently faced with the need to resolve conflicts when multiple missions contend for the same time windows of opportunity. This proposal is for an oversubscribed mission scheduler conflict resolution system that will rapidly provide feasible schedules using innovative boolean satisfiability methods and then leverage software agent personas to minimize or eliminate conflicts in scheduling. Agents will free up valuable human resources in the de-conflict loop, using an ask-offer process to negotiate future timeslots based on a deferred value function. Phase 1 will demonstrate the feasibility of applying mature SAT solver process to the rapid generation of feasible schedules and also demonstrate the potential for the application of semi-autonomous belief-desire-intent (BDI) agents to conflict resolution and user interface support. Phase 2 will evolve proof-of-concept prototypes into fully functional systems.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Aligned Concepts, LLC	Lead Organization	Industry	Longwood, Florida
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Florida	Ohio

Project Transitions

▶ **January 2010:** Project Start

✓ **July 2010:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/139316>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Aligned Concepts, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

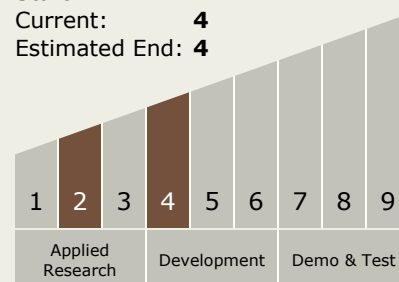
Carlos Torrez

Principal Investigator:

Don E Asumu

Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



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Technology Areas

Primary:

- TX10 Autonomous Systems
 - └ TX10.2 Reasoning and Acting
 - └ TX10.2.2 Activity and Resource Planning and Scheduling

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System